Jeongbhin Seo

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EDUCATION

Pusan National University (PNU), Korea, Ph.D., Earth Science
Advisor: Prof. Hyesung Kang
Thesis title: A Simulation Study of Ultra-relativistic Jets — Sep, 2018 - Aug, 2022

PNU, Korea, M.A., Earth Science — Mar, 2015 - Feb, 2018

PNU, Korea, B.A., Earth Science Education — Mar, 2008 - Feb, 2012

EMPLOYMENT

Postdoctoral Researcher, Department of Physics,
Ulsan National Institute of Science & Technology — 2022-present

AWARDS AND FELLOWSHIPS

Busan Future Scientist Award
Federation of Busan Science and Technology — Dec, 2021

Research grant for doctoral students
The National Research Foundation of Korea — 2020-2022

PEER-REVIEWED PAPERS

Jeongbhin Seo and Dongsu Ryu, "HOW-MHD: A High-Order WENO-Based Magnetohydrodynamic Code with a High-Order Constrained Transport Scheme", Accepted in ApJ, arXiv : 2304.04360 (2023)

Jeongbhin Seo, Dongsu Ryu, and Hyesung Kang, "A Simulation Study of Ultra-relativistic Jets. III. Particle acceleration at FR-II jets", *The Astronomical Journal*, 944, 199 (2023)

Jeongbhin Seo, Hyesung Kang, and Dongsu Ryu, "A Simulation Study of Ultra-relativistic Jets. II. Structures and Dynamics of FR-II Jets", *The Astronomical Journal*, 920, 144 (2021)

Jeongbhin Seo, Hyesung Kang, Dongsu Ryu, Seungwoo Ha, Indranil Chattopadhyay "A Simulation Study of Ultra-relativistic Jets. I. A New Code for Relativistic Hydrodynamics ", *The Astronomical Journal*, 920, 143 (2021)

Jeongbhin Seo, Hyesung Kang, and Dongsu Ryu, "The Contribution of Stellar Winds to Cosmic Ray Production ", *Journal of the Korean Astronomical Society*, 51, 37 (2018)

MANUSCRIPT IN PROGRESS

Jeongbhin Seo, Dongsu Ryu, and Hyesung Kang, "A Simulation Study of Ultra-relativistic Jets - IV. Particle acceleration at FR-I jets"

Bhattacharjee Ayan, **Jeongbhin Seo**, Hyesung Kang, and Dongsu Ryu, "A Study of Morphology of FR-I Jets"

PROCEEDINGS

Jeongbhin Seo, Hyesung Kang, and Dongsu Ryu, "A New Code for Relativistic Hydrodynamics and its Application to FR II Radio Jets ", *IAU Symposium*, 362, 87 (2023)

INTERNATIONAL CONFERENCES

Jeongbhin Seo, Dongsu Ryu, and Hyesung Kang, "Generation of Ultra-High Energy Cosmic Rays at Radio Galaxy Jets". (Talk) *ICGAC15.* Jul 2023; Gyeongju, Korea

Jeongbhin Seo and Dongsu Ryu, " A New WENO Magnetohydrodynamic Code with a High-Order Constrained Transport Scheme". (Poster) *2023 ASTRONUM.* Jun 2023; Pasadena, CA, USA

Jeongbhin Seo, Hyesung Kang, and Dongsu Ryu, "Particle acceleration at relativistic jets of FR-II radio galaxies". (Poster) *2022 IAUGA.* Sep 2022; Busan, Korea

Jeongbhin Seo, Hyesung Kang, and Dongsu Ryu, "Relativistic Hydrodynamic Simulations of Ultra-relativistic Jets in the Intracluster Medium". (Poster) *2022 EAS.* June 2022; Valencia, Spain

Jeongbhin Seo, Hyesung Kang, and Dongsu Ryu, "A New Code for Relativistic Hydrodynamics and its Application to FRII Radio Jets". (Contribution Talk) *IAU Symposium 362: Computational astrophysics* Nov 2021; Online

DOMESTIC CONFERENCES

Jeongbhin Seo and Dongsu Ryu, "A New Magnetohydrodynamic Code with a High-Order Constrained Transport Scheme". (Talk) *2023 107th KAS Spring Meeting.* Apr 2022; Jeonju, Korea

Jeongbhin Seo, Hyesung Kang, and Dongsu Ryu, "Acceleration of Ultra-high Energy Cosmic Rays at Relativistic Jets". (Talk) *2022 105th KAS Spring Meeting.* Apr 2022; Busan, Korea

Jeongbhin Seo, Hyesung Kang, and Dongsu Ryu, "FR-II radio jets and the acceleration of UHECRs". (Talk) *2021 104th KAS Fall Meeting.* Oct 2021; Jeju, Korea

Jeongbhin Seo, Hyesung Kang, and Dongsu Ryu, "Structures and Energetics of Flows in Ultra-relativistic Jets". (Talk) *2021 103th KAS Spring Meeting.* Apr 2021; Online, Korea

Jeongbhin Seo, Hyesung Kang, and Dongsu Ryu, "A New Code for Relativistic Hydrodynamics". (Poster) *2020 102th KAS Fall Meeting.* Oct 2020; Online, Korea

Jeongbhin Seo, Hyesung Kang, and Dongsu Ryu, "Morphology and Dynamical Properties of Ultra-Relativistic Jets". (Talk) *2020 102th KAS Fall Meeting.* Oct 2020; Online, Korea

SEMINARS AND COLLOQUIA

Jeongbhin Seo, "Acceleration of Ultra-High Energy Cosmic Rays at Radio Galaxy Jets". *Max-Planck institute: The VLBI Group Seminar.* Mar 2023; Online, Germany

Jeongbhin Seo, "A Simulation Study of Radio Galaxy Jets". *2023 SKA-Korea Workshop.* Jan 2023; Cheonan, Korea

Jeongbhin Seo, "Particle Acceleration in Radio Galaxy Jets". *6th CHEA Workshop.* Dec 2022; Cheonan, Korea

Jeongbhin Seo, "An introduction to relativistic hydrodynamics simulation and its application". *66th GWNR Workshop.* Sep 2022; Pohang, Korea

Jeongbhin Seo, "FR-II radio jets and the acceleration of UHECRs". *Korea young Astronomers Meeting Colloquium.* Dec 2021; Online, Korea

Jeongbhin Seo, "FR-II radio jets and the acceleration of UHECRs". *5th CHEA Workshop.* Nov 2021; Busan, Korea

Jeongbhin Seo, "A simulation study of ultra-relativistic jets". *4th CHEA Workshop.* Jan 2020; Busan, Korea

Jeongbhin Seo, "The contribution of Stellar Winds to Cosmic Ray Production". *3rd CHEA Workshop.* Jan 2019; Gyeongju, Korea

COLLABORATION

Center for High Energy Astrophysics (CHEA), UNIST, Korea 2019 - present
Wombat User Group, University of Minnesota, USA 2022 - present

HIGH PERFORMANCE COMPUTING

UNIST Supercomputing Center, RHD Simulation, 2 Million CPU Times
CHEA Cluster, MHD, RHD, Monte-Carlo Simulation, 2 Million CPU Times
PNU Cluster, HD, RHD, Monte-Carlo Simulation, 500 thousand CPU Times

PROGRAMING LANGUAGE

Fortran, Python, IDL, OpenMP, MPI

RESEARCH SKILLS

Hydrodynamics (HD), Relativistic Hydrodynamics (RHD), Magneto-Hydrodynamics (MHD), Monte-Carlo simulation, Simulation code development

PUBLIC OUTREACH

"Path to Becoming an Astrophysicist". May 2023, Gaeun Middle School, Yangsan, Korea
"Path to Becoming an Astrophysicist". May 2023, Muryong High School, Ulsan, Korea
"From a earth science teacher to an astrophysical researcher". Nov 2022, PNU Future Education Center, Pusan, Korea
"What does an astrophysicist do?". Oct 2022, Gaeun Middle School, Yangsan, Korea
"Career Mentoring Program - Astrophysicist". Jul 2022, PNU Future Education Center, Pusan, Korea
"The use of coding in astrophysics". Dec 2021, Mulgeum High School, Yangsan, Korea
"What does an astrophysicist do?". Nov 2021, Muryong High School, Ulsan, Korea

SCIENCE COMMUNICATION

Teacher, Gyeongsangnam-do Office of Education 2012-2019
Teaching Assistant, Pusan National University 2020-2022